Summary of Impact Assessment

The alternatives were analyzed to determine the potential for adverse and beneficial impacts associated with implementation of the various CVPIA programs. Impacts under the alternatives, as compared to the No-Action Alternative, are the result of changes in water facilities operations and deliveries, and structural improvements which, in turn, directly or indirectly affect surface and groundwater, power resources, fish and wildlife, vegetation, agricultural land use, recreational opportunities, the regional and local economy, social conditions, and cultural resources. Changes to other resource areas could not be defined at the programmatic level.

Changes in Water Facilities Operations and Deliveries

Changes to CVP operations are similar in all alternatives and were primarily related to 1) assumed reduced diversions from the Trinity River Basin to the Sacramento River; 2) increased releases from Shasta Lake in fall, spring, and summer to meet target flows and to meet requirements in the Sacramento River that had been partially met by water from the Trinity River Basin; 3) increased flows on Clear Creek in non-critically dry years; 4) reduction in summer releases from Folsom Lake to increase storage in September and to stabilize flows from October through February in the American River; and 5) increased instream flows in the Stanislaus River during non-critically dry years.

Primarily as a result of assumed decreased Trinity River Basin diversions to the Sacramento River and (b)(2) Water Management, average annual CVP exports in the Delta decrease. CVP operations in the Delta under the Preferred Alternative include a combination of instream releases and water acquisitions to increase Delta outflows during some periods and export limitations. The CVP operations in the Delta are similar in Alternatives 1 and 2 and Supplemental Analyses 1b through 1i and 2a through 2c. Under Alternative 3 and Supplemental Analysis 3a, acquired water could be exported and, therefore, the annual exports by both the CVP and SWP increase as compared to other alternatives. Under Alternative 4 and Supplemental Analyses 1a and 4a, Delta exports are reduced as compared to the other alternatives due to the implementation of (b)(2) Water Management in the Delta in addition to the Bay-Delta Plan and use of acquired water in the streams and in the Delta.

The alternatives have varying effects on CVP water deliveries. Water deliveries to CVP water service contractors are less in each of the alternatives as compared to the No-Action Alternative. Water deliveries to the water rights contractors and exchange contractors do not change between the No-Action Alternative and the other alternatives. CVP water operations could vary significantly under Supplemental Analyses 1c and 2d as compared to the other alternatives. Under these alternatives, CVP water service contract demands are reduced by 570,000 acre-feet/year due to the high price of CVP water under the alternatives. The water could be reallocated to other CVP contractors, used to meet other fish and wildlife needs, or transferred by the CVP contractors with reduced demands. If this water is used by other CVP contractors or transferred, CVP operations may not change noticeably. If the water is used for fish and wildlife needs, reservoir storage and stream flows may change significantly.

Several alternatives call for water acquisitions to increase instream flows in the river where the water is acquired and also in downstream rivers and in the Delta. For the water acquisition actions under the Preferred Alternative, water generally would either be released in the spring or stored for release in the fall. Similar operations are assumed for Alternatives 2, 3, and 4 and Supplemental Analyses 2a through 2d, 3a, and 4a.

Changes in Groundwater Resources

Impacts on groundwater result from changes in surface and groundwater use, crop mix and irrigation techniques, and stream flows.

Groundwater depth increases in the Sacramento Region, San Joaquin Region and the Tulare region under the Preferred Alternative. In Alternatives 1, 2, and 3, the groundwater depth would increase in Sacramento, San Joaquin, and the northern Tulare Lake regions. Depth would decrease in the southern Tulare Lake region. All regions would have a depth increase in Alternative 4.

Changes in Power Resources

Changes in CVP operations, especially increased flows in the Trinity River Basin, shift patterns of CVP power generation. Under all alternatives, generation shifts from summer months to the spring and fall months when the demand for hydropower is less. Overall, generation is reduced. The cost of replacement power to meet summer month loads may increase the overall cost of power supplies to CVP preference power customers. Under the Preferred Alternative, CVP loads are reduced. CVP loads were reduced in all other PEIS Alternatives.

Changes in Fishery Resources

Conditions for fish in CVP-controlled rivers and the Delta generally improve under all alternatives and supplemental analyses as a result of increased flows and non-flow actions such as fish screen and fish passage improvements, habitat restoration, improved water quality, and predator control.

Under the Preferred Alternative, flows and habitat for fish are increased on the Sacramento, American, Stanislaus, Tuolumne, and Merced rivers, Clear Creek and tributaries to the Sacramento River as compared to the No-Action Alternative. Fishery conditions in the Delta would improve due to increased Delta inflows and outflows, reduced pumping and additional fish protections.

Under Alternative 1 and Supplemental Analyses 1a through 1i, flows for fish are increased on CVP-controlled rivers, and reservoirs are reoperated to reduce short-term flow fluctuations. These actions generally improve environmental conditions although adverse effects occur on some streams for some species. Supplemental Analyses 1a and 1b improve fishery conditions in the Delta as compared to Alternative 1 due to increased Delta inflows, reduced pumping, and additional fish protection.

Alternative 2, and Supplemental Analyses 2a through 2d include all the benefits of Alternative 1 and improve conditions in the Stanislaus, Tuolumne, Merced, and the lower San Joaquin rivers and in the Delta with respect to temperatures, improved habitat, reduced losses to diversions, improved fish movement, and improved food web support. Additional fish protection under Supplemental Analysis 2a would further improve fishery conditions in the Delta.

Alternative 3 and Supplemental Analysis 3a include all benefits of Alternative 2 and further improve conditions on the Yuba, Mokelumne, Calaveras, Stanislaus, Tuolumne, and Merced rivers and in the Delta.

Alternative 4 and Supplemental Analysis 4a include all the benefits of Alternative 3 and add improvements to passage, diversions, and flow in the Delta.

Changes in Vegetation and Wildlife

Under the Preferred Alternative, land fallowing and retirement would benefit special-status and other wildlife species in the San Joaquin River and Tulare Lake regions. Riparian restoration on rivers in the Sacramento River and San Joaquin River regions has locally beneficial effects on the extent and condition of riparian habitat. Level 2 refuge water supplies increase wetland habitat available to waterfowl and shorebirds. Flooding of up to 80,000 acres of agricultural habitat during winter offers major benefits to migratory waterfowl, shorebirds, and wading birds, including special-status species. Implementation of the (b)(1) "other" program would benefit species not specifically identified in the CVPIA through habitat restoration, maintenance, enhancement, and protection.

The impacts associated with implementing Alternative 1 and Supplemental Analyses 1a through 1i are similar to the Preferred Alternative.

Impacts of Alternative 2 and Supplemental Analyses 2a through 2d are similar to those of Alternative 1; in addition, higher spring flows on the Stanislaus, Tuolumne, and Merced rivers increase water levels in the San Joaquin River at Vernalis, and benefit riparian habitat. Level 4 refuge water supplies allow optimal management of refuges.

Impacts of Alternatives 3 and 4 and Supplemental Analyses 3a and 4a are similar to those of Alternative 2, plus additional agricultural land is fallowed and conservation easements may be acquired on a portion of the land. Further, increased flows in the Stanislaus, Tuolumne, and Merced rivers lead to greater improvements in riparian vegetation on the San Joaquin River near Vernalis.

Changes in Agricultural Land Use and Economics

Throughout the Central Valley, a reduction of irrigated acreage and gross revenue reduction would be expected under all alternatives, with the highest reductions occurring under Alternative 4.

In all alternatives, the total percentage change in irrigated acreage would be greatest in the San Joaquin River region which includes the land retirement program. Land retirement actions would also reduce irrigated acreage in the Tulare Lake region.

The provisions that would potentially affect agricultural land use and economics include (b)(2) water management for fish and wildlife, water acquired for stream flows and refuges, water pricing, restoration payments, water conservation and measurement, land retirement, and water transfers.

Changes in Recreational Opportunities

Recreational opportunities under the No-Action Alternative are about $145 million per year in recreation-related expenditures at major reservoirs and refuges in the Sacramento River region and about $85 million per year in the San Joaquin River and Tulare Lake regions combined.

Under the Preferred Alternative, recreational use at major reservoirs changed less than 1 percent although recreational use of refuges increased significantly. This impact also occurred under all PEIS alternatives. Recreational use of refuges increased over 60% with implementation of the Preferred Alternative as compared to the No-Action Alternative. Recreation use at refuges increased over 25% under Alternative 1 and Supplemental Analyses 1a through 1i and over 60% in all other alternatives, as compared with the No-Action Alternative.

Changes to Regional Economics and Social Conditions

By increasing water related benefits provided by the Central Valley Project, the provisions of CVPIA would contribute to the overall economic and environmental sustainability of California. Implementation of CVPIA results from a variety of impacts to the regional economy and social conditions.

The Preferred Alternative would result in the lowest total estimated impact on jobs, approximately 0.04% loss in the Central Valley, compared to the other PEIS alternatives. Impacts under all alternatives would be partially offset by increases in economic activity during the period of construction of restoration actions. The loss of jobs also would be partially offset by a slight increase in economic activity due to increased revenues from water sales and increased recreation expenditures. The job losses would not be significant if distributed uniformly over an entire region, such as in the Sacramento River region. However, farm communities in the San Joaquin River and Tulare Lake regions on the Westside may be more severely affected.

Cultural Resources

Under some alternatives, including the Preferred Alternative, cultural resources may be affected; however, those impacts could not be quantified at the programmatic level. As project-specific documentation is undertaken, those impacts can be properly assessed and mitigation measures developed, as appropriate.

Before implementing individual actions, Interior will comply with Section 106 of the National Historic Preservation Act to account for the effects on historic properties. Interior will develop mitigation measures pursuant to Section 106 and will consult with the Advisory Council and State Historic Preservation Office.

Environmental Justice and Indian Trust Assets

Executive Order 12898 requires that federal agencies analyze the impacts of alternatives to identify and evaluate disproportionate impacts to minorities and low income populations. The impacts of the Preferred Alternative and other Alternatives occur throughout the Central Valley; therefore, it is difficult to conclude that one social group would be adversely affected to a greater extent by any of the alternatives. The impacts reflect the type of labor requirements required for agricultural production and skill and education level.

Reclamation policy is to protect American Indian Trust Assets and to determine if alternatives would affect the use and enjoyment of trust assets. None of the alternatives would adversely affect reserved water rights, water quality of the water rights, hunting and fishing rights, or noise near a land asset. Increased stream flows associated with the alternatives could positively affect Indian Trust Assets located adjacent to rivers and the associated hunting and fishing rights.